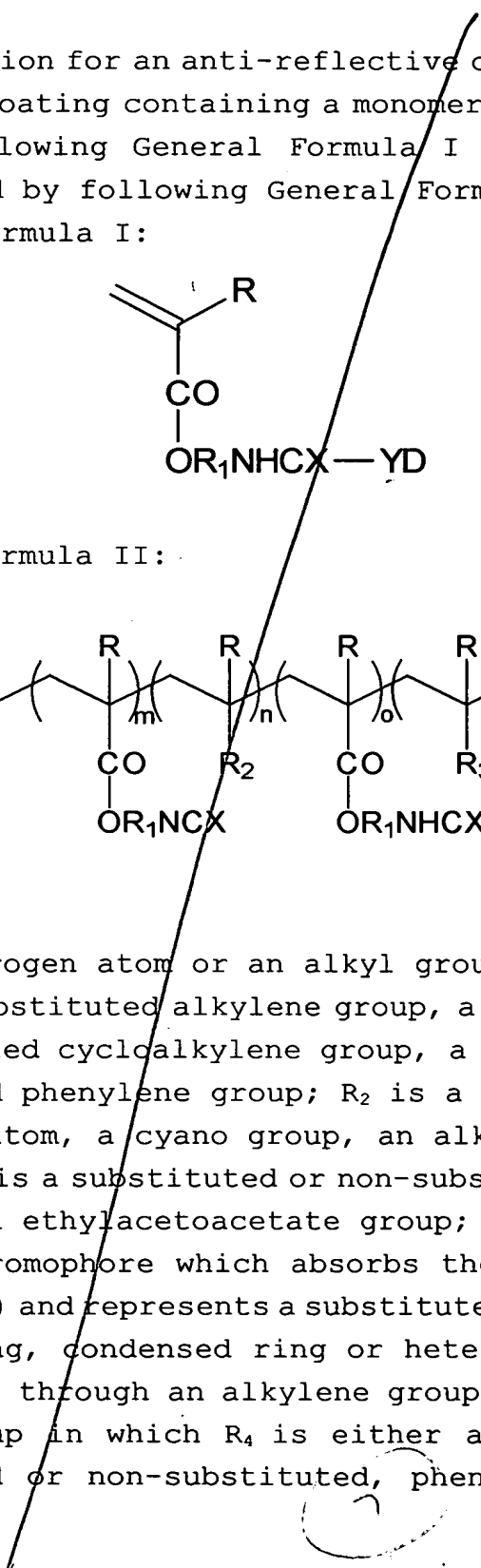


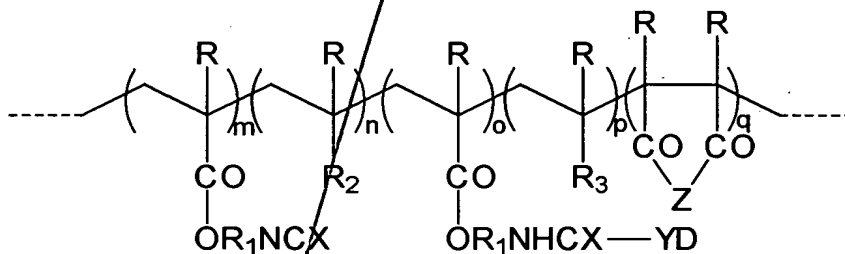
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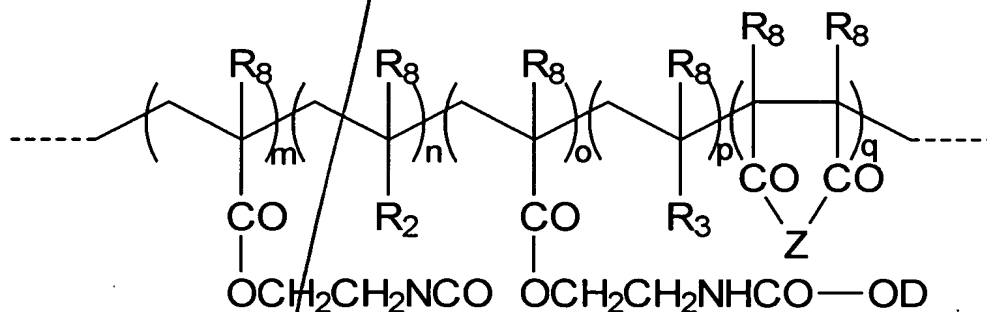
THE FUTURE

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linear or branched alkyl group; Z is O, ND group or NR₅ group in which R₅ is either a hydrogen atom or a substituted or non-substituted, phenyl group or cyclic, linear or branched alkyl group; and n, p and q are simple integers including zero and m and o are also simple integers including zero while at least one of them is greater than zero.

2. A composition for an anti-reflective coating or a radiation absorbing coating according to claim 1, wherein the polymer as represented by General Formula II is a polymer as represented by following General Formula II'.

General Formula II'

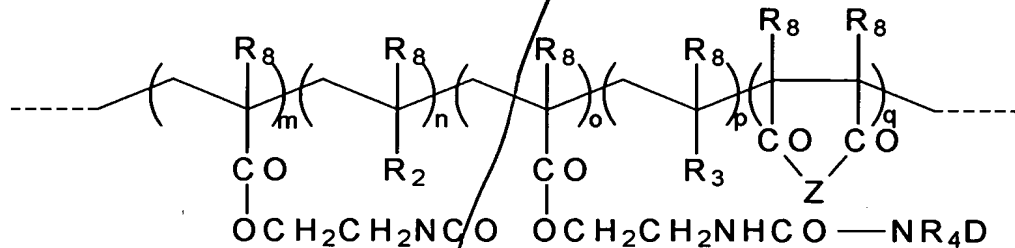


Wherein

R₈ is a hydrogen atom or a methyl group; R₂ is a phenyl group, -COOH, a halogen atom, a cyano group, an alkoxyl group or -COOR₆ in which R₆ is a substituted or non-substituted, alkyl or aryl group or an ethylacetoacetate group; R₃ is -COOD; D is an organic chromophore which absorbs the exposed wavelength (100-450 nm) and represents a substituted or non-substituted, benzene ring, condensed ring or heterocyclic ring bonded directly or through an alkylene group; Z is O, ND group or NR₅ group in which R₅ is either a hydrogen atom or a substituted or non-substituted, phenyl group or cyclic, linear or branched alkyl group; and m, n, o, p and q are simple integers including zero while at least one of m and o is greater than zero and m, n, o, p and q together lie between 5 to 50,000.

3. A composition for an anti-reflective coating or a radiation absorbing coating according to claim 1, wherein the polymer

as represented by General Formula II is a polymer as represented by following General Formula II".
General Formula II"



Wherein

R_8 is a hydrogen atom or a methyl group; R_2 is a phenyl group, ---COOH , a halogen atom, a cyano group, an alkoxyl group or ---COOR_6 in which R_6 is a substituted or non-substituted, alkyl or aryl group or an ethylacetoacetate group; R_3 is ---COOD ; D is an organic chromophore which absorbs the exposed wavelength (100-450 nm) and represents a substituted or non-substituted, benzene ring, condensed ring or heterocyclic ring bonded directly or through an alkylene group; R_4 is either a hydrogen atom or a substituted or non-substituted, phenyl group or cyclic, linear or branched alkyl group; Z is O , ND group or NR_5 group in which R_5 is either a hydrogen atom or a substituted or non-substituted, phenyl group or cyclic, linear or branched alkyl group; and m , n , o , p and q are simple integers including zero while at least one of m and o is greater than zero and m , n , o , p and q together lie between 5 to 50,000.

4. A composition for an anti-reflective coating or a radiation absorbing coating according to claim 2 or 3, wherein D is a group selected from phenyl, substituted phenyl, benzyl, substituted benzyl, naphthalene, substituted naphthalene, anthracene, substituted anthracene, anthraquinone, substituted anthraquinone, acridine, substituted acridine, azobenzene, substituted azobenzene, fluorime, substituted fluorime, fluorimone, substituted fluorimone, carbazole, substituted carbazole, N-alkylcarbazole, dibenzofuran,

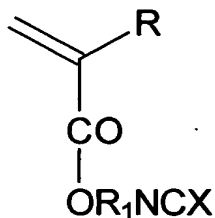
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substituted dibenzofuran, phenanthrene, substituted phenanthrene, pyrene and substituted pyrene, and the substitutions thereof are at least one group selected from alkyl, aryl, halogen, alkoxyl, nitro, aldehyde, cyano, amide, dialkylamino, sulfonamide, imide, carboxylic acid, carboxylic acid ester, sulfonic acid, sulfonic acid ester, alkylamino, and arylamino.

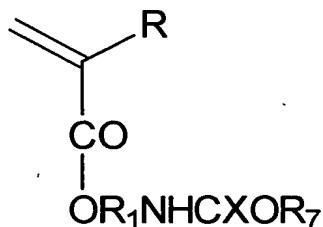
- San* *22* *05*
5. A composition for an anti-reflective coating or a radiation absorbing coating according to claim 2 or 3, wherein m, n, p and q are zero and o lies between 5 to 50,000.
6. A composition for an anti-reflective coating or a radiation absorbing coating according to claim 2 or 3, wherein n, p and q are zero and m and o together lie between 5 to 50,000 and the mole fraction of m is between 0.05 to 0.95.
7. A composition for an anti-reflective coating or a radiation absorbing coating according to claim 2 or 3, wherein m, p and q are zero and n and o together lie between 5 to 50,000 and the mole fraction of n is between 0.05 to 0.95.
8. A composition for an anti-reflective coating or a radiation absorbing coating according to claim 2, 3 or 7, wherein R_2 is $-COOR_6$ in which R_6 is a methyl group, ethyl group, t-butyl group, isopropyl group, ethylacetoacetate group, 2-hydroxyethyl group, or n-butyl group.
9. A composition for an anti-reflective coating or a radiation absorbing coating according to claim 2 or 3, wherein p and q are zero and m, n and o together lie between 5 to 50,000 and the mole fraction of n is between 0.05 to 0.95.
10. A composition for an anti-reflective coating or a radiation absorbing coating according to claim 2 or 3, wherein Z is ND group in which D is an organic chromophore which absorbs the exposed wavelength (100-450 nm) and represents a substituted or non-substituted, benzene ring, condensed ring or heterocyclic ring bonded directly or through an alkylene group and n, o and p are zero and m and q together lie between 5 to 50,000 and the mole fraction of q is between 0.05 to 0.50.

11. A composition for an anti-reflective coating or a radiation absorbing coating according to claim 2 or 3, wherein n, o and q are zero and m and p together lie between 5 to 50,000 and the mole fraction of m is between 0.05 to 0.90.
12. A composition for an anti-reflective coating or a radiation absorbing coating according to claim 2 or 3, wherein q is zero and m, n, o and p together lie between 5 to 50,000.
13. A composition for an anti-reflective coating or a radiation absorbing coating according to claim 1 containing an additional compound as represented by following General Formula III and/or following General Formula IV.

General Formula III



General Formula IV



Wherein

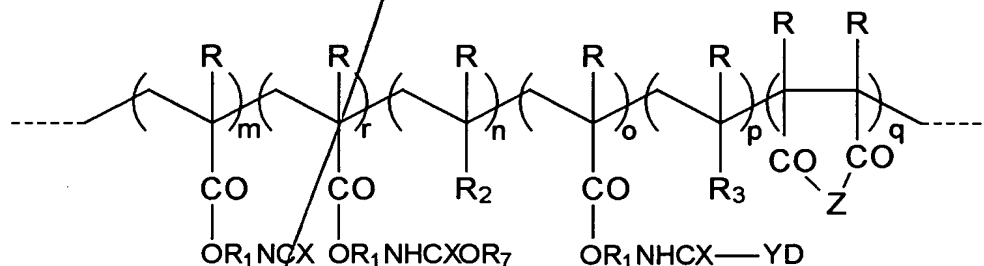
R is a hydrogen atom or an alkyl group; R₁ is an alkylene group, a substituted alkylene group, a cycloalkylene group, a substituted cycloalkylene group, a phenylene group or a substituted phenylene group; R₇ is a substituted or non-substituted, linear or branched alkyl group or a substituted or non-substituted cyclohexyl group bonded directly or through an alkylene group; and X is O or S.

14. A composition for an anti-reflective coating or a radiation absorbing coating in which isocyanate or

thioisocyanate group-containing polymer and/or monomer as represented by General Formula II described in claim 1 and/or General Formula III described in claim 13 respectively are further added to a composition for an anti-reflective coating or a radiation absorbing coating containing free amines or hydroxyl group containing compounds.

15. A composition for an anti-reflective coating or a radiation absorbing coating containing a polymer as represented by following General Formula V.

General Formula V



wherein

R is a hydrogen atom or an alkyl group; R₁ is an alkylene group, a substituted alkylene group, a cycloalkylene group, a substituted cycloalkylene group, a phenylene group or a substituted phenylene group; R₂ is a phenyl group, -COOH, a halogen atom, a cyano group, an alkoxyl group or -COOR₆ in which R₆ is a substituted or non-substituted, alkyl or aryl group or an ethylacetoacetate group; R₃ is -COOD; D is an organic chromophore which absorbs the exposed wavelength (100-450 nm) and represents a substituted or non-substituted, benzene ring, condensed ring or heterocyclic ring bonded directly or through an alkylene group; X is O or S; Y is O or NR₄ group in which R₄ is either a hydrogen atom or a substituted or non-substituted, phenyl group or cyclic, linear or branched alkyl group; Z is O, ND group or NR₅ group in which R₅ is either a hydrogen atom or a substituted or non-substituted, phenyl group or cyclic, linear or branched alkyl group; R₇ represents a substituted or non-substituted, linear or branched alkyl group, or a substituted or non-

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- $$\text{---} \left(\text{---} \underset{\text{CO}}{\overset{\text{R}}{\text{C}}} \right)_m \left(\text{---} \underset{\text{R}_2}{\overset{\text{R}}{\text{C}}} \right)_n \left(\text{---} \underset{\text{CO}}{\overset{\text{R}}{\text{C}}} \right)_o \left(\text{---} \underset{\text{R}_3}{\overset{\text{R}}{\text{C}}} \right)_p \left(\text{---} \underset{\text{CO}}{\overset{\text{R}}{\text{C}}} \right)_q \text{---}$$
- OR_1NCX
 $\text{OR}_1\text{NHCX} \text{---} \text{YD}$

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heterocyclic ring bonded directly or through alkylene group; X is O or S; Y is O or NR₄ group in which R₄ is either a hydrogen atom or a substituted or non-substituted, phenyl group or cyclic, linear or branched alkyl group; Z is O, ND group or NR₅ group in which R₅ is either a hydrogen atom or a substituted or non-substituted, phenyl group or cyclic, linear or branched alkyl group; and n, p and q are simple integers including zero and m and o are also simple integers including zero while at least one of them is greater than zero.

18. A polymer according to claim 17, wherein R is a hydrogen atom or a methyl group, R₁ is an ethylene group, X is an oxygen atom and Y is an oxygen atom, D is an organic chromophore which absorbs the exposed wavelength (100-450 nm) and represents a substituted or non-substituted, benzene ring, condensed ring or heterocyclic ring bonded directly or through alkylene group, and n, p and q are simple integers including zero and m and o are also simple integers including zero while at least one of them is greater than zero.

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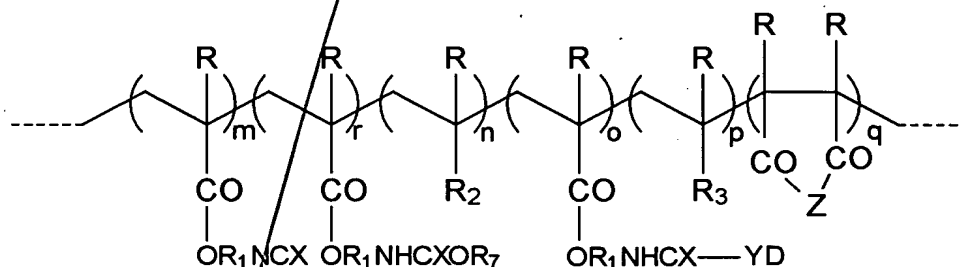
19. A polymer according to claim 17, wherein R is a hydrogen atom or a methyl group, R₁ is an ethylene group, X is a oxygen atom, Y is -NR₄ group in which R₄ is either a hydrogen atom or a substituted or non-substituted, phenyl group or cyclic, linear or branched alkyl group, D is an organic chromophore which absorbs the exposed wavelength (100-450 nm) and represents a substituted or non-substituted, benzene ring, condensed ring or heterocyclic ring bonded directly or through an alkylene group, and n, p and q are simple integers including zero and m and o are also simple integers including zero while at least one of them is greater than zero.

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20. A polymer according to claim 18 or 19, wherein o is a simple integer greater than zero and D is a group selected from phenyl, substituted phenyl, benzyl, substituted benzyl, naphthalene, substituted naphthalene, anthracene,

substituted anthracene, anthraquinone, substituted anthraquinone, acridine, substituted acridine, azobenzene, substituted azobenzene, fluorime, substituted fluorime, fluorimone, substituted fluorimone, carbazole, substituted carbazole, N-alkylcarbazole, dibenzofuran, substituted dibenzofuran, phenanthrene, substituted phenanthrene, pyrene and substituted pyrene, and the substitutions thereof are at least one group selected from alkyl, aryl, halogen, alkoxy, nitro, aldehyde, cyano, amide, dialkylamino, alkylamino, sulfonamide, imide, carboxylic acid, carboxylic acid ester, sulfonic acid, sulfonic acid ester, and arylamino.

21. A polymer represented by following General Formula V.
General Formula V



Wherein

R is a hydrogen atom or an alkyl group; R₁ is an alkylene group, a substituted alkylene group, a cycloalkylene group, a substituted cycloalkylene group, a phenylene group or a substituted phenylene group; R₂ is a phenyl group, -COOH, a halogen atom, a cyano group, an alkoxyl group or -COOR₆ in which R₆ is a substituted or non-substituted alkyl or aryl group or an ethylacetoacetate group; R₃ is -COOD; D is an organic chromophore which absorbs the exposed wavelength (100-450 nm) and represents a substituted or non-substituted, benzene ring, condensed ring or heterocyclic ring bonded directly or through alkylene group; X is O or S; Y is O or NR₄ group in which R₄ is either a hydrogen atom or a substituted or non-substituted, phenyl group or cyclic, linear or branched alkyl group; Z is O, ND group or NR₅ group in which

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R₅ is either hydrogen atom or a substituted or non-substituted, phenyl group or cyclic, linear or branched alkyl group; R₇ represents a substituted or non-substituted, linear or branched alkyl group or a substituted or non-substituted cyclohexyl or phenyl group bonded directly or through alkylene group; and m, n, o, p and q are simple integers including zero and r is a simple integer greater than zero.

22. A method of producing a composition for an anti-reflective coating or a radiation absorbing coating described in claim 2 or 3 which comprises of following steps;

- a) dissolving the polymer having isocyanate groups in one or more solvents, and
- b) reacting the isocyanate groups either partially or fully with amino aromatic and/or hydroxyl aromatic chromophores at room temperature or elevated temperature if necessary.

23. A method of forming an anti-reflective coating or a radiation absorbing coating which comprises of following steps;

- a) filtering the composition for an anti-reflective coating or a radiation absorbing coating produced according to claim 22 with 0.5 and 0.2 micron filters,
- b) applying the filtered solution directly onto a semiconductor substrate, and
- c) baking the coated substrate at 50 to 250 °C.

24. A method of producing a composition for an anti-reflective coating or a radiation absorbing coating described in claim 22, wherein the solvent is cyclopentanone, cyclohexanone, butyrolactone, propylene glycol monomethyl ether acetate, 2-heptanone, ethyl lactate, ethyl-3-ethoxy propanate, ethylene glycol monoethyl acetate, or methyl-3-methoxy propanate individually or mixtures thereof.

25. A method of forming an anti-reflective coating or a radiation absorbing coating comprising of following steps;
a) applying the composition for an anti-reflective coating or a radiation absorbing coating described in any one of claim

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1 to 16 onto the semiconductor substrate, and b) removing the solvent at least partially by baking to form a substrate coated with an anti-reflective coating or a radiation absorbing coating.

26. An anti-reflective coating or a radiation absorbing coating formed by the method according to claim 23 or 25.

27. A method of making integrated circuits comprising the following steps;

a) coating a positive- or negative-working photoresist sensitive to at least one wavelength of ultraviolet radiation in the range of about 190 to 450 nm onto a substrate coated with the anti-reflective coating or the radiation absorbing coating prepared by the method according to claim 23 or 25,

b) exposing the substrate coated with the anti-reflective coating or the radiation absorbing coating and the resist,

c) developing the exposed resist, and

d) transferring the image onto the substrate by dry or wet etching to form an integrated circuit element.

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